Total Maximum Daily Loading (TMDLs) and Mechanical Aquatic Harvesting

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Managing a bay, lake or pond requires special attention to the levels of nutrient inputs particularly Nitrogen (N) and Phosphorus (P). The term "watershed management" is the universal practice of limiting nutrients that provide the basic food supply for *primary productivity* (growth of phytoplankton). The process of over enrichment of nutrient inputs to water resulting in excess phytoplankton growth is called eutrophication. Simple phytoplanktonic organisms are called algae. Eventually complex vascular plants grow in sufficient nutrient rich water.

Nitrogen can enter a body of water through ground water or through the atmosphere. Phosphorus tends to attach to the fine grain surface sediments and enters waterways during a precipitation event (rain or snow). Human activities increase the inputs of N & P through wastewater disposal, stormwater runoff, industrial discharges, farming, and other practices.

The common method for limiting nutrients to waterways has been voluntary watershed management, which can take decades to show improvement. In the 1970s, scientists and policy makers established the Clean Water Act to establish and fortify previous pollution control federal policies. Nutrient reduction has been one of the key focuses of the EPA and state regulators in charge of water quality.

Today watershed management is central to virtually any land development proposal including better plant buffer areas around littoral zones, reducing runoff and increasing open space to lower impervious drainage. Unfortunately watershed management has not been especially successful. Many communities have made successful reductions in N & P, but objectively speaking the watershed management approach alone has been less than effective.

Actual removal of nutrients from a body of water can only be effectively done with aquatic mechanical harvesting. The best logical immediate approach is for water managers to develop a strategy of reducing nutrient inputs through good watershed management and simultaneously removing algae and invasive aquatic plants through aquatic harvesting.

Doing nothing or delaying improvement on improving bays, lakes or ponds is not an option. Impaired bodies of water are required to lower N & P levels or face

penalties. Prudent water managers and consultants are aware of the Total Maximum Daily Loading (TMDLs) for the water body they manage. The **Weedoo**[INC] method is the most advanced cost-effective method for removing unwanted aquatic plant material quickly and safely.

Pesticides will kill unwanted aquatic plants in freshwater systems, but the chemical approach does nothing to remove nutrients. In saltwater, pesticides are not used because of tidal flushing. Applying a chemical in freshwater will destroy unwanted aquatic plants or algae, but the decaying plant material degrades into dead aquatic biological material or *detritus*. New organisms can utilize detritus as a source of nutrients in addition to any new inputs of N and P. The chemical approach only recycles nutrients and facilitates the increased build-up of nutrients. Unfortunately the chemical approach is counter-productive to compliance with TMDL regulations.

To effectively comply with the TMDL requirements of the EPA Clean Water Act, nutrient levels must be reduced and *time is of the essence*. Both federal and state water quality regulators jointly set TMDL levels for given impaired water bodies and municipalities are required to reduce nutrients within a given timetable to avoid violations.

The **Weedoo**[INC] method offers the best affordable and expedient approach to comply with the TMDL provisions of the Clean Water Act. Large and small bodies of water have TMDL requirements and should be reviewed by the water manager. Ultimately, the municipality (or owner of the water body) is solely responsible for complying with the Clean Water Act and should take proactive steps to comply with TMDL standards. The specialists at **Weedoo**[INC] are able to assist our customers on ways to avoid TMDL penalties and better comply with TMDL water quality standards.

References & Resources

General Information on the Environmental Protection Agency:
https://www3.epa.gov/

EPA Link on Contact Information on TMDLs
https://www.epa.gov/tmdl/forms/contact-us-about-impaired-waters-and-tmdls

EPA Link on the Clean Water Act:
https://www.epa.gov/laws-regulations/summary-clean-water-act

EPA Link on TMDLs and Identifying Impaired Water Listings
https://www.epa.gov/tmdl/identifying-and-listing-impaired-waters